eighteenth century; and in the early part of its successor four other species became extinct in the neighbouring islands of the Mascarene group, namely, *Testudo indica*, *T. triserrata* and *T. inepta* in Mauritius, and *T. vosmaeri* in Rodriguez. It has likewise been considered probable that the thin-shelled tortoise (*T. abingdoni*), of Abingdon Island, in the Galapagos group, is also no longer existing, although it was certainly alive as recently as 1875.

Of birds that have disappeared during the century, in addition to the great auk, reference may first be made to the black emeu (*Dromaeus ater*), of Kangaroo Island, South Australia. When this island was explored in 1803 by a French expedition these birds were abundant, and three were sent home to Paris, where a pair lived till 1822. On their death, the skin of one and the skeleton of the other were mounted for exhibition in the Paris Museum, where they still remain. Of the third specimen no record was obtainable till 1900, when, as already noticed in this journal, its skeleton was discovered by Prof. Giglioli in the museum at Florence. These three priceless specimens are the only examples of a species which became extinct in the native state previous to the death of the Paris pair, and before it was even known to be different from the larger emeu of the mainland. For it appears that some years after the visit of the French expedition (to which Péron was naturalist) to Kangaroo Island, a settler squatted there and forthwith set to work to make a clean sweep of the emeus and kangaroos—a task in which he was only too successful.

Before the middle of the century another large bird appears to have made its final exit from this world. When Steller discovered the northern sea-cow in the islands of Bering Sea, he also brought to the notice of science a new species of cormorant (*Phalacrocorax perspicillatus*), which was especially interesting on account of being the largest representative of its kind, and likewise by the bare white rings round its eyes and the brilliant lustre of its green and purple plumage. Stupid and sluggish in disposition, Pallas's cormorant, as the species is commonly called, appears to have been last seen alive about the year 1839, when Captain Belcher, of H.M.S. *Sulphur*, was presented with a specimen by the Governor of Sitka, who also forwarded other examples to Petersburg. Captain Belcher's specimen is preserved in the British Museum, and three other skins are known to be in existence elsewhere.

The great white water-hen (*Notornis albus*), formerly inhabiting Lord Howe and Norfolk Islands, must be added to the defunct list. And the same is the case with the Tahiti rail (*Prosobonia leucoptera*) and Latham's white-winged sandpiper (*Hypotaenidia pacifica*), the latter of which in Captain Cook's time was abundant in the island above named, as well as in the neighbouring Eimeo. The New Zealand quail (*Coturnix novaezealandiae*) is likewise entered in the British Museum list as extinct. The beautiful "*Pigeon hollondais*," so-called from its plumage presenting the Dutch colours, and technically known as *Alectoroenas nitidissima*, is a Mauritian species whose extermination probably took place during the century. It is known solely by three examples, one of which is preserved at Port Louis, the second in Paris, and the third in Edinburgh.

Nor must we omit from our list two species of Kaka parrot, one of which (*Nestor productus*) was a native of Philip Island, while the home of the second (*N. norfolcensis*) was the neighbouring Norfolk Island. A species of parraquet (*Palaeornis exsul*), peculiar to the island of Rodriguez, is also believed to be exterminated.

Neither has the duck family escaped, for the well-known pied duck (*Camptolaemus labradorius*), an ally of the eider from the North Atlantic coast of America, appears in the defaulters' list, the last-known example having been killed in 1852.

Passing on to Passerine birds, a notable loss is the handsome crested pied starling, *Fregilupus varius*, which is believed to have become extinct about the middle of the century. Of the few remaining examples of this striking species one is preserved in the British Museum. Another species, exterminated within approximately the same period, is the gorgeous black and gold mamo, or sicklebill (*Drepanis pacifica*), of Hawaii, whence it was first brought to Europe by Captain Cook. As narrated in the "Birds of the Sandwich Islands," by Messrs. Scott Wilson and Evans, the extermination of this beautiful species is to be attributed to persecution for the sake of its yellow feathers, which were used for the cloaks of the native chiefs. About four specimens are known to be preserved in museums.

Of birds that have been locally exterminated, such as the burrowing petrel (*Œstrelata haesitata*), known in the Antilles as the diablotin, it is not our intention to speak on this occasion. And this article may accordingly be fitly brought to a close by an extract from Prof. A. Newton's "Dictionary of Birds," referring to two instances where species may have perished within the century without having ever come definitely under the notice of ornithologists. After stating that one Ledru accompanied an expedition dispatched by the French Government in 1796 to the West Indies, the Professor proceeds to observe that this explorer "gives a list of the birds he found in the islands of St. Thomas and St. Croix. He enumerates fourteen kinds of birds as having occurred to him then. Of these there is now no trace of eight of the number; and, if he is to be believed, it must be supposed that within fifty or sixty years of his having been assured of their existence they have become extinct. . . . If this be not enough we may cite the case of the French islands of Guadeloupe and Martinique, in which, according to M. Guyon, there were once found six species of Psittaci, all now exterminated; and it may possibly be that the macaws, stated by Gosse and Mr. March to have formerly frequented certain parts of Jamaica, but not apparently noticed there for many years, have fallen victims to colonisation and its consequences." R. L.

CLIMBING IN THE HIMALAYAS.[1]

DURING an extended cycling tour in the East, the authors spent the summer months of 1898 and the following year in the Himalayas. In the former season they penetrated from Srinagar, which they had reached on their vehicles, into the mountains of Ladakh, Nubra, and Suru, and, later on, into Sikkim from Darjeeling. Next year they took with them Matthias Zurbriggen, who had been guide to Sir Martin Conway on his memorable journey in 1892, retracing his steps up the Biafo Glacier to the Hispar Pass, and then making some important ascents in the district about the Skoro La Pass. Altogether they were encamped for many days at altitudes not less than 16,000 feet, crossed several passes more than a thousand feet higher, and made the ascent of three virgin icy summits, rising to heights of 18,600, 19,450, and 21,000 feet respectively. Thus Mrs. Workman not only is the first of her sex to do serious mountain work in the Himalayas, but also has been higher than any of them above sea-level.

Climbing in the Himalayas, as the authors remark, is a much more serious affair than in the Alps. The glaciers and peaks, as shown by the excellent illustrations, one of which is appended by the courtesy of the publisher, are certainly not less difficult; roads are often wanting, mountain inns and chalets always; the camp must be pitched far away from even the smallest of towns; provisions, wraps, tents, all requisites, must be transported by human labour, which is costly and entails endless difficulties. The misdeeds of porters were once a stock subject of complaint among alpine climbers, but the worst of them are surpassed by Indian coolies, who are ill-fed, ill-clad and without mountain experience, while the native servants, almost universally, are adepts in cheating and mendacity. Through their misconduct one expedition, that into Sikkim, was a complete failure; and on this occasion the travellers apparently had good reason to complain of the British Political Officer at Darjeeling—not the one, it may be observed, whose courtesy Mr. D. Freshfield experienced on his tour round Kinchinjanga.

---

[1] "In the Ice World of Himalaya, among the Peaks and Passes of Ladakh, Nubra, Suru, and Baltistan." By Fanny Bullock Workman and William Hunter Workman, M.A., M.D. With three maps and sixty-seven illustrations. Pp. xvi + 204. (London: T. Fisher Unwin, 1900.)

On the second year's journey they plunged more deeply into the Himalayan ice world. After reaching Askole by the Skoro La Pass, nearly 17,000 feet above sea-level, they ascended the Biafo glacier, which had shrunk and changed since 1892, to the Hispar Pass, from which they obtained splendid views of the neighbouring snowy giants, afterwards returning to Askole. Again leaving it they pitched a camp above the Skoro La Glacier, 16,200 feet from sea-level, at which, or a higher one, they remained for six days. From it they ascended the Siegfriedhorn, an excellent point of view 18,600 feet high, and the snowy Mount Bullock Workman, 19,450 feet. Returning over the Skoro La Pass they struck up the Shigar Valley, and finally, from a camp 17,900 feet above sea-level, reached, in unfavourable weather, the summit of Koser Gunge, about 21,000 feet.

The book is pleasantly written, though we cannot think such words as "itemized" and "motived" valuable additions to the English language. In addition to vivid descriptions of the scenery, it records, though professedly a work on mountain travel, some facts of scientific interest. The authors, like all recent travellers in the higher Himalayas, were struck with the signs of rapid disintegration. The great changes of temperature shatter the rocks, and strew the mountain flanks with fragments, forming huge slopes of débris and great alluvial fans. On one occasion they had a rather narrow escape when "a mixture of solid and semi-solid bodies," consisting of "mud and stones of every size, some of them many tons in weight, which were rolled on one another as if they were pebbles, poured down a glen, sweeping everything before it"—a mass twenty to thirty feet in height and some sixty yards in breadth. The work of mountain sculpture evidently proceeds more rapidly in the Himalayas than in the Alps. Yet there was probably a time when the latter passed through a similar stage. Mud glaciers, if the phrase be permitted, are not unknown in them, but much material, often hastily classed as moraine, is really of very composite origin, and is transported more by water than by ice.

The last chapter of the book, which gives a summary of their experiences of the effects of diminished atmospheric pressure, has a special value because Dr. Workman can speak as a medical expert. They lived for many days at heights between fourteen and seventeen thousand feet, sleeping several times in camps between sixteen and eighteen thousand feet, and thrice reached elevations between the last and twenty-one thousand feet. Their experiences agree generally with those of Whymper, Conway, FitzGerald and Vines. Below 15,000 feet Dr. Workman noticed no great departure from the normal. In the higher camps he slept well, though Mrs. Workman did not; they had good appetites, neither suffered from mountain sickness or, with one exception in each case, from headache, and this they attributed to cold rather than diminished atmospheric pressure; but both, like all their predecessors, felt the effects of the latter increasingly perceptible after rising above some 16,000 feet. They made slower progress, got more readily out of breath, and from about 18,000 feet upwards found that all movements, even stooping or altering the position when at rest, had to be made with deliberation—even holding the breath for a moment to take a snap-shot with the camera was followed by gasping. But by accommodating themselves to the conditions they climbed without severe discomfort, and did not find that

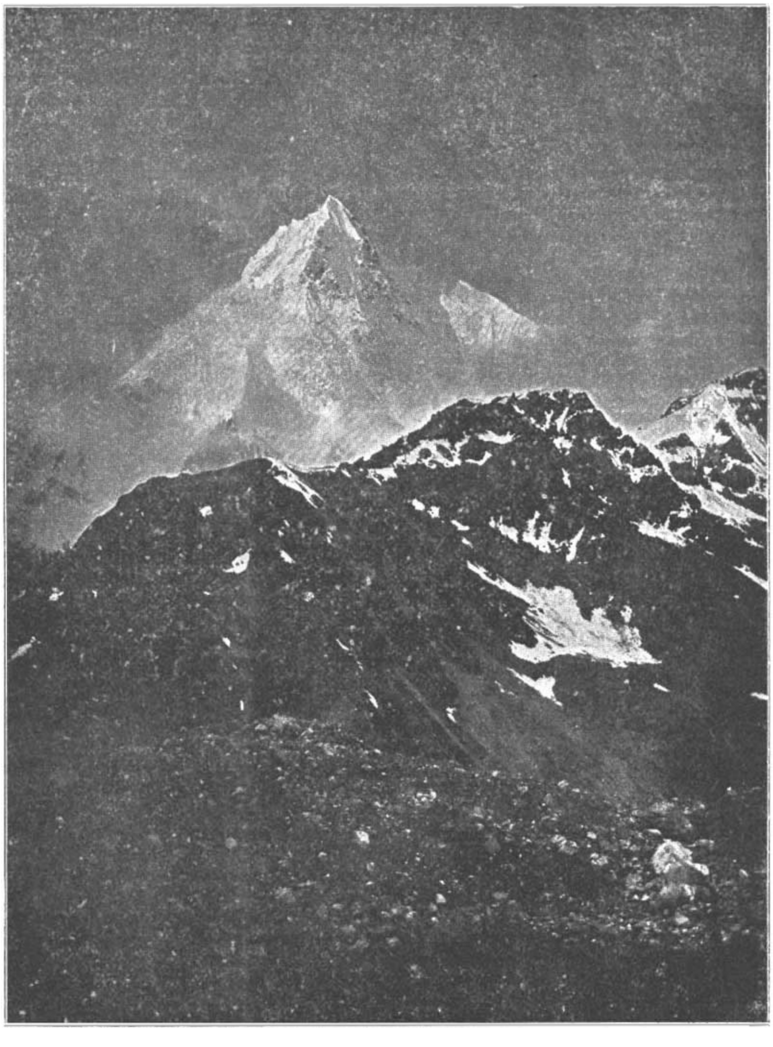

FIG. 1.—Siniolehum, Sikkim.

this materially increased in the ascent to the highest point attained. The commissariat, in Dr. Workman's opinion, is a most important factor for success in reaching great elevations, since he holds dyspepsia and imperfect nutrition responsible for the distressing symptoms experienced by some of his predecessors. Food should be rather light, but nutritious. He makes some valuable remarks on the best kinds, stating that he thinks alcohol beneficial if it be taken in very moderate quantities and at meal times; warm wraps also are most important. In fact, his careful discussion of the subject is a valuable supplement to what has been already published, and proves that climbers anxious to reach the highest summits of Asia must possess either the *dura messorum ilia* or the purse which can bear the very heavy cost of a well-equipped expedition. T. G. BONNEY.

THE ROYAL INDIAN ENGINEERING COLLEGE.

FROM letters which have been published recently in the *Times* and other journals, we have become aware of the following facts relating to the Royal Indian Engineering College, Coopers Hill:—

(1) The Secretary of State for India, acting on certain suggestions, made to him ostensibly by the Board of Visitors of the College, for remodelling the course of instruction on a very extensive scale, decided, some considerable time back, that it was necessary to dismiss *half the educational staff* of the College for the purpose of "reducing the present excessive cost of the staff and increasing the efficiency of the teaching."

(2) No hint that this momentous change was coming was conveyed to any of the seven gentlemen concerned, who received their first intimation on the 17th of last month from the President of the College, Colonel J. W. Ottley, in a letter of singular abruptness, heartlessness and irony. This letter, addressed to each of the seven gentlemen, was as follows:

> "Sir, I have the honour to forward for your information a copy of a letter, P.W. 2531, dated 14th inst., from which you will see that I am instructed to convey to you the decision of the Secretary of State for India in Council that you will be required to vacate your appointment at this College at the end of the next Easter term.
>
> "I have the honour to be, Sir, your obedient servant,
>
> "JOHN W. OTTLEY, President, R.I.E.C."

The seven gentlemen to whom this communication was made are Mr. T. A. Hearson, M.Inst.C.E., Professor of Hydraulic Engineering, &c.; Mr. H. McLeod, F.R.S., Professor of Chemistry; Mr. W. N. Stocker, M.A., Professor of Physics; Mr. A. H. Heath, Assoc.M.Inst.C.E., Assistant Professor of Engineering; Mr. T. Shields, M.A., Demonstrator in Physics; Mr. P. Reilly, Demonstrator, Mechanical Laboratory; Mr. J. C. Hurst, Lecturer in Accounts.

With reference to the first of these facts we may affirm with confidence that the drastic changes—which involve serious curtailments of the branches of engineering and chemistry, and, apparently, the total abolition of physics and electrical engineering—are not to be attributed to the Board of Visitors. It is not credible that these gentlemen—very busy men as some of them are—can have devoted so much time and study to the educational course of the College as to justify their taking the responsibility of advising the Secretary of State for India to effect such extensive changes. We are compelled to adopt the conclusion that Colonel Ottley (whose name appears for the first time in the College Calendar for 1899–1900) himself is the real author. If this is so, we are further compelled to inquire into Colonel Ottley's qualifications as an educationist and a man of science. We are not acquainted with any scientific treatises or papers of his authorship, nor are we aware that he was selected as the head of a scientific college because of any experience as a lecturer on scientific subjects. His predecessors at the College have been, we believe, like himself, officers of Royal Engineers; but, apparently, they were wise enough to keep their theoretical autocracy as presidents within the limits prescribed by common sense.

From the memorial addressed by the dismissed members of the staff to the Secretary of State we infer that Colonel Ottley interprets his autocracy very literally, and is disposed to take no advice from the educational staff on matters of which they must necessarily know vastly more than he; and if so, it ought to be abundantly clear to the India Office that Coopers Hill College must be, as an educational institution, a complete failure.

It will be observed that the subjects which are most affected by the change—chemistry, physics and the mechanical laboratory—are those in which practical work has an important place; it is well known to those experienced in scientific education that this practical work is of the greatest value in developing in students the scientific spirit which is so essential to success in such a profession as engineering. We believe that the laboratories at Coopers Hill were enlarged some years ago and the staff increased, so that every student should have instruction in the chemical, physical and mechanical laboratories, on the recommendation of the Board of Visitors; but at that time one of the members of the Board was Sir William Siemens, who, knowing the result of practical work in the German universities upon industries and professions, considered its further development at Coopers Hill to be of importance. The present action appears to be in direct opposition to the former recommendations of the Board of Visitors.

Turning our attention next to the second of the above facts, we are compelled to express not only astonishment but indignation that such heartless brutality should have been possible in England. To know that seven gentlemen—two of them members of the Institution of Civil Engineers and another a Fellow of the Royal Society—are to receive a three months' notice of dismissal, timed, as it would seem, by the clock; to know that it must be of the utmost importance to them to be warned of the impending catastrophe so that they may have opportunities for seeking other work; and yet to keep their sentence a dead secret until the last available moment, constitutes a condition of mind which, we hope, is very rare among Englishmen.

The cause of Coopers Hill College is, in this matter, the cause of education at large. All that the dismissed members of the staff have asked from the India Office is that an independent committee of experts in scientific engineering, education, and college management should be appointed to inquire into the way in which the College is managed.

But we go beyond this request. We would make an appeal to men of science and of learning to make, either by deputation or by memorial, a representation to the India Office of the widespread feeling of disapproval with which this official action, for which the Secretary of State for India is responsible, is regarded, and of the desirability of ensuring to the educational staff of the College at Coopers Hill such influence in educational matters as is accorded in every College in the Kingdom.

NOTES.

PROF. STRASBURGER has been elected a correspondant of the Paris Academy of Sciences, in the section of botany.

THE death is announced of Dr. Potain, professor of medicine in the University of Paris, and member of the section of medicine and surgery of the Paris Academy of Sciences.

IT is announced by *Science* that Prof. W. W. Campbell has been appointed director of the Lick Observatory, in succession to the late Prof. J. E. Keeler.

AT a special meeting of the Metropolitan District Railway Company on Monday, it was resolved that capital should be raised for the purpose of adapting the line to electric traction. This action has been forced upon the company by the diversion of traffic to the Central Electric Railway, and omnibus competition.

WE regret to announce the death of Dr. G. Pacher, of Padua University, on December 29, at the age of thirty-three. We owe to him some valuable studies of the records of the Vicentini microseismograph, and also the application of the pantagraph to that instrument.

THE Board of Trade have appointed a committee consisting of Lord Rayleigh, F.R.S., chairman, Sir John Wolfe-Barry, K.C.B., F.R.S., and Prof. Ewing, F.R.S., to consider to what